Modified PTO/SB/33 (10-05)

PRE-APPEAL BRIEF REQUEST FOR REVIEW	Docket Number Q83823	
	Application Number 10/510,183	Filed September 30, 2004
Mail Stop AF Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	First Named Inventor Johan RANSQUIN	
	Art Unit 1795	Examiner Asha J HALL

WASHINGTON OFFICE
23373
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Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal

The review is requested for the reasons(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

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September 14, 2009
Date

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Johan RANSQUIN, et al.

Appln. No.: 10/510,183

Confirmation No.: 6804

Filed: September 30, 2004

Docket No: Q83823

Group Art Unit: 1795

Examiner: Asha J HALL

For: CONCENTRATION SOLAR BATTERY PROTECTED AGAINST HEATING

PRE-APPEAL BRIEF REQUEST FOR REVIEW

MAIL STOP AF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to the Pre-Appeal Brief Conference Pilot Program, and further to the Examiner's Final Office Action dated March 13, 2009, Applicant files this Pre-Appeal Brief Request for Review. This Request is also accompanied by the filing of a Notice of Appeal.

The present invention is an improvement in an arrangement of the type (shown in Fig. 1) having a photovoltaic (PV) cell 101 covered by a protection layer 102. Desired radiation (i.e., light in the wavelength range that will lead to efficient PV conversion) passes through the layer 102 while undesired light is reflected away at 105. To improve the output of the PV cell, one or more reflectors 106 are located so as to receive additional light 107 and reflect it toward the cell at 108, with angles of incidence and reflection and the refractive indices being such that desired radiation will be refracted (109) toward the PV cell surface, while undesired radiation (110) is reflected away. The problem addressed by the present invention is that the filtering operation of the layer 102 is not ideal, and much undesired radiation gets through to the PV cell, contributing to the heat build up of the cell without contributing anything to the PV cell output.

The improvement according to the present invention, in its simplest form, is the addition of a filtering layer 206 to the reflecting concentrator, as shown in Fig. 2. Incident light 107 will now strike the filtering layer 206 and the desired wavelengths will be refracted toward the reflecting surface 106, while unwanted radiation 218 will be reflected away. The desired radiation 207 that is refracted toward the reflector 106 will be reflected as shown at 217 and will then again be refracted at the surface 116 toward the photovoltaic cell.

The application includes 7 claims, of which only claim 1 is independent. Claims 1, 3-5 and 7 are rejected as unpatentable over Applicant Admitted Prior Art (AAPA) in view of Horne. Claim 2 is rejected over the same art and further in view of Chappell et al. Claim 6 is rejected as unpatentable over AAPA and Horne and further in view of Leinkram.

Horne is directed to a concept shown in Fig. 7 where a thermal heat source 80 radiates heat through a micromesh filter 50 to obtain a desired transmitted energy spectrum 86. One of the applications of this concept is photovoltaic cells (see, e.g., lines 18-23 of column 1). In Fig. 36 cited by the examiner, incident light would pass through a filter array 172, then through a concentrating prism 170, and then strike the photovoltaic cell 174. Thus, in comparison to Fig. 1 of the present application, radiation passes through filter 172, then is concentrated by 170 and then strikes PV cell 174, whereas in the AAPA the radiation is concentrated by reflector 106, then passes through filter 102 and then strikes the PV cell 101.

If it is assumed for purposes of this discussion that it would have been obvious to combine the teachings of Horne and the AAPA, one might eliminate the filter 102 and concentrator 106 of the AAPA and instead mount filter 172 and concentrating prism 170 of Horne on top of the PV cell 101 in the AAPA. This would be the substitution of one alternative for another. This would not result in the invention of the present application.

Another alternative, since the filter 102 of the AAPA and the filter 172 of Horne serve a similar purpose, would be to place the concentrating prism 170 on top of the layer 102 in the AAPA, and eliminate both the reflector 106 and the filter 172, both of which would be redundant. In other words, with reference to Fig. 37 of Horne, whether the filter 172 is behind

the prism 170 or in front of it would not seem to be critical, but there would not seem to be any reason to use both.

The examiner in the present Office action proposes that the filter 172 of Horne would be placed over the reflector 106 in the AAPA, but it is submitted that this is only based on hindsight. First, there is already a filter 102 in the AAPA. Second, the filter 172 of Horne, like the filter 102 of the AAPA, is a reflecting filter. It would not have been obvious to place over the reflector 106 in the AAPA a filter which operates by reflection. The reflector 106 lies at an angle with respect to both the incident light 107 and the photocell 101 such that light reflected from the reflector will be directed (108) toward the PV cell. A filter layer of constant thickness (like layer 172 of Horne) and whose reflecting surface is therefore parallel to the reflector 106, and whose primary filtering function is reflection of undesired radiation, would end up reflecting all of that undesired radiation toward the PV cell. So in the arrangement proposed by the examiner the reflecting filter 172 placed over the concentrating reflector 106 would be useless. This could not possibly have been obvious.

Claims 2 and 3 are directed to an embodiment as shown in Fig. 3 where the thickness of the layer 306 is uniform and the filtering function is by absorption. The examiner relies additionally on Chappell in rejecting claim 2, but this simply illustrates the problem of why the basic rejection of the parent claim is unwarranted. In order to even arguably have obviousness of placing the Horne filter layer 172 over the reflector 106 of the AAPA, one must first change the fundamental filtering mechanism from reflection to absorption, and/or modify the structure of the filter layer such that the reflected light is no longer directed to the PV cell. But this is counterintuitive when you start with the AAPA arrangement where the whole purpose of the reflector 106 is to reflect light toward the PV cell.

It is also noteworthy that an absorption filter will generate more heat than a reflecting filter, due to the heat relating to the absorption of the energy of the radiation. One would not want an absorption filter on the PV cell. Horne does not want an absorption filter for filter 172, because the generated heat is transmitted through the block prism to the PV cell. It is only when

the filter is placed somewhere physically detached from the PV cell that the heat of absorption becomes tolerable. There is no discussion of this in Horne. So in the context of the particular modification proposed by the examiner, one would not change the Horne filter to an absorption filter unless a decision were already made to put it on the reflector 106, but one would not put it on the filter 106 unless a decision had already been made to make it an absorption filter instead of a reflecting filter. It may seem to the examiner through hindsight to have been obvious, but it is only with hindsight.

Claims 4 and 5 are directed to the arrangement in Fig. 2 where the filter layer 206 is of gradually changing thickness so that inclined surface will reflect unwanted radiation (218) away and at the same time will refract (208) the desired reflected radiation (217) toward the PV cell. The thickness change and surface orientation recited in claims 4-5 is specific to the manner in which the filter of Fig. 2 operates, which is totally different from Horne. Contrary to the examiner's assertion that there is no disclosure as to the impact of the claimed thickness changes, note Fig. 2 which illustrates how the inclination of the surface 116 relative to the surface of 106 will impact the reflection angles and thereby impact what is or is not reflected or the angles of refraction of whatever is not reflected, both the first time through the filter and the second time through the filter. And the specification at page 4 describes in detail the role of inclining the surface 116. The examiner disagrees with this in the Advisory Action of July 28, but looks only at the drawings and ignores the description in the specification of the role of the thickness change and inclined surfaces. Horne teaches reflection, but not controlling the inclination angle of the surface of the filter as is recited in claims 4-5.

As to claim 6, that claim is dependent on claim 4 which is dependent on claim 1. For the reasons given above, it would not have been obvious to place a filter layer over the reflector 106 in the AAPA if the filter layer filters by reflection, because the unwanted reflected light would simply be directed to the PV cell, which would be undesirable. Yet in his rejection of claim 6 the only reason the examiner gives for modifying the filter layer to include the Fresnel steps of Leinkram would have been to obtain a theoretically ideal Fresnel lens plate and thereby increase

reflection (final Office action, page 6). This would not make sense, and the rationale clearly fails.

For the above reasons, reversal of the examiner is requested.

Respectfully submitted,

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